REMARKS

Claims 1-14, 16-20, 25-31, 33-34, 56-57, 67-68, 92-93, 95, and 115-116 stand rejected; claims 15, 21-24, 32 and 94 have been cancelled; and claims 35-55, 58-66, 69-91 and 96-114 have been withdrawn.

Claims 1, 56, and 67 have been amended to recite a size limitation on the microdevices of the invention; the size limitation ("has dimensions from about 0.01 micron to about several thousand microns") is taken from the specification at page 15:2-3. The specific statement refers to the preferred size of a microparticle, but the same paragraph states that "the microdevice of the present invention is an example of a microparticle." Pg. 15:6-7. The amendment thus adds no new matter. Claims 16, 27 and 67 have also been amended to improve readability; these amendments do not add new matter.

New dependent claims 117-119 have been added, also. These are supported by the specification at page 20, lines 5-6, 6-7, and 7-8 respectively, so they add no new matter. Entry of these amendments is respectfully requested.

Claim Rejections - 35 U.S.C. § 102

Claims 1-2, 4, 5, 10, 16-20, 25-27, 67-68, 92, 115-116 are rejected under 35 U.S.C. 102(b) as being anticipated by Van Deusen et al. (US 5132097). The Office states:

> Van Deusen et al. teach a device for analysis of specific biological binding complexes. Van Deusen et al. teach that the device comprises a substrate, a photorecognizable coding pattern, i.e. holes on the substrates, and binding partners, such as antigen or antibody, where the photorecognizable coding holes do not penetrate through the entire depth of the substrates and the device do not need an anodized metal surface (See Figure 1-2; 6-7; Col. 5, line 25-35).

The Applicant traverses this rejection.

The claimed invention is a microdevice having dimensions of up to about several thousand microns, a size that is equal to several millimeters (1 micron is 10^{-6} meters, so 1000 microns = 10^{-3} meters, which is 1 mm). Specification, pg. 15: lines 2-9. At page 20, a specific microdevice embodiment having a rectangular shape with dimensions of 1 mm by 1 mm is described; the other embodiments described are smaller still. Pg. 20:9-15. Thus the microdevices are, as the name suggests, generally small. Furthermore, the microdevices are described as being manipulable in a microfluidic setting. Pg. 14:27-29.

The device described in Van Deusen is not a microdevice: while its size is not discussed, it includes several separate zones for binding reagents and one for a separate binding standard; see, e.g., Fig. 7. It is described as a "test strip" (e.g., col.2:57), which would ordinarily be read to refer to a macroscopic device when, as here, the context is silent as to size. And it incorporates a data storage strip for identification purposes that is read by a device according to U.S. Patent 4,544,835. See col. 5:44-48 in reference to Figure 4; and col. 6:25-32 in reference to Figures 5-6; and col. 6:50-56, describing how to read the embodiment in Fig. 7. Thus Van Deusen provides a device having a reflective strip for an optical reader; but the specified reader is from US 4,544,835, which is entitled, "Data System Containing a High Capacity Optical Contrast Laser Recordable Wallet-Size Plastic Card." The device of Van Deusen is thus enabled at most for reading a credit-card sized device: the reference makes no effort to enable a smaller device. Since the cited reference is not enabled for a microdevice, it cannot enable or anticipate the microdevices of the present claims. *Elan Pharmaceuticals, Inc. v. Mayo Foundation,* Case No. 00-1467 (Fed. Cir., 2003).

Also, the device in Van Deusen does not possess 'holes' part way through a substrate as required for the claimed invention. The 'holes' in Van Deusen are holes <u>through</u> a reflective coating on one surface of the test strip. See, e.g., Figure 6: the reader and light source 31 are both above the strip. But even if the reader were below the strip, there would still be holes <u>through</u> the reflective coating. The holes that Van Deusen describes must go 'through' the reflective coating in order for differential light transmission from that layer to provide a photodetectable pattern. See col. 5:27-31. By contrast, the holes in claim 1 expressly do NOT penetrate through the substrate

("...a hole not penetrating through the entire depth of said substrate..."). Thus regardless of whether the test strip 12, or the reflective coating 32, or the supporting 'substrate' 21 is equated to the 'substrate' of present claim 1, Van Deusen *does not provide any of these 'layers' with a hole that penetrates only part way through.* There is no hole needed through the top layer (test strip), and none is described: that layer is transparent (col. 7:43-47 or *see e.g.* Figure 6). The hole must go all the way through the reflective coating, which is arguably not a 'layer' at all, although it is not fully described. But even if it were a layer and could be equated to the 'substrate' in the present claims, its hole goes all the way through. Finally, there is no need for a hole to go through the backing, which Van Deusen refers to as a 'substrate', because it is beneath the reflective coating.

More importantly for establishing an anticipation rejection, no hole part way through this or any layer is disclosed by the reference. A finding of anticipation requires the Office to show that every element of the claimed invention is present explicitly or inherently in the prior art. Verdegaal Bros. v. Union Oil, 814 F.2d 628, 2 USPQ2d 1051 (Fed Cir. 1987). Therefore, the lack of a "a hole not penetrating through the entire depth of said substrate" in Van Deusen, particularly in light of the other substantial differences related to the size of the Van Deusen device, precludes a finding of anticipation. Withdrawal of this rejection is thus respectfully requested.

Claim Rejections - 35 U.S.C. § 103

Claims 1, 5, 16-20, 25-27, 33-34, 67-68, 92-93, 115-116 are rejected under 35 U.S.C. 103 as being unpatentable based on Toshiyuki, et al. (JP 05-240869) in view of Siegel, et al. (US 5985543). (This was written as a 35 U.S.C. 102(b) rejection, but the heading and description clearly indicate it is an obviousness rejection.) According to the Office:

> Toshiyuki et al. teach a medical device for distinguishing blood agglutination, i.e. condensation, from an array of blood samples. Toshiyuki et al. teach that the device comprises a substrate, and a photorecognizable coding pattern, i.e. holes not penetrating through the entire depth on the substrate, where the different of blood agglutination expression can be distinguished by the patterns of these holes on the substrate (See Abstract; Figure 5 and 13). The device of Toshiyuki et al. reference does not explicitly teach anodization on the surface layer. The device of Toshiyuki et al. is for determination of blood

> agglutination, it is inherent that no anodization would be required because blood samples contain both positive and negative cell surface, whereas anodization would only attract negatively charged cellular component. However, Toshiyuki et al. do not explicitly disclose using a binding partner in the device.
>
> Siegel et al. teach using binding partners, e.g. antigen or antibody, to characterize agglutination of blood cells in a sample in an specific and efficient fashion (See Background of the Invention: Details of Invention; Figure 2). Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to have provided Toshiyuki et al. with the binding partners, such as blood-specific antibody or antigen, as taught by Siegel et al. to take the advantage of efficiency and economy.

The Applicant appreciates the machine translation of the Toshiyuki reference provided by the Examiner: while not perfect, it is clearly useful in helping to understand the abstract. The device described by Toshiyuki is expressly a "microplate" or an array of microplates, that much is clear from the abstract and claims. It is more difficult to ascertain whether "the hole P" goes all the way through the device, or to determine what structure of the device would correspond to the 'substrate' of the present claims. But it is clear that 'hole P' is there to provide a "characteristic discrimination pattern for every plate." Toshiyuki, ¶ [0019] of the machine translation, page 17. (The Office indicated that Toshiyuki used the holes in its measurement of blood coagulation; however, paragraphs [0019] and [0007] make it clear that the holes are merely a built-in tracking device for the microplates.)

The nature of the Toshiyuki device also appears to be clear: it is a microplate, and does not seem to be described in any way that would depart from the art-recognized meaning of that term. While the term does not refer to a specific device, and can certainly vary in size to some degree, a 'microplate' refers to a particular type of plate for holding a plurality of liquid samples. Attached as **Exhibit A** is a list of the sizes of microplates currently offered by Perkin Elmer, to indicate what the term would mean to one of skill in the art. Admittedly a microplate is not limited to a specific size or shape, though there are certain commercial standards gaining acceptance as illustrated by the length and width dimensions common to all of the microplates in this list. What is clear, though, is that a microplate contains an array of wells for holding liquid samples, which wells

are characterized by a well volume. The smallest well volume in this list is 12 microliters; and that requires a plate about 10 mm thick (Last two lines of Exhibit A), which is larger than the claimed microdevices. It seems reasonable to infer that making a microplate significantly smaller than the commercial ones is impractical, or at least is believed in the art to be impractical.

Toshiyuki, consistent with the term microplate, is concerned with wells that must hold liquid samples—blood, to be precise. (The Abstract refers to a "lattice of reaction vessel (wells)..."; presumably this refers to an array of wells such as that depicted in the Figures of the patent—*see, e.g.*, Figure 1.) Thus Toshiyuki is clearly concerned with macroscopic items: as a practical matter, the device would not be functional if it were shrunk to a size that did not permit the wells to hold a useful amount of a liquid sample. Toshiyuki expressly describes a plurality of sample wells, see e.g. paragraph [0014], and as far as the Applicant can tell there is no discussion in Toshiyuki of miniaturizing the microplates: Toshiyuki appears to be concerned *only* with providing a way to track such microplates. (Paragraph [0007] describes the problem to be solved, and appears to be concerned with lost bar code labels.)

To anticipate the present claims, the reference would have to provide a device that is only a few millimeters in size at most. The reference does not appear to suggest making the plates smaller than commercially available ones. So while the device of Toshiyuki is not expressly size limited, one of ordinary skill would read 'microplate' to refer to a plate at least about 10 mm thick and much larger than that in its length and width. Nothing in the reference would motivate one to shrink the Toshiyuki device to make a 'microdevice' within the size range of the present claims. To do so would likely abolish its practical utility and defeat its purpose: at the very least it would create an entirely new set of practical issues that Toshiyuki does not appear to address or solve. Therefore, no obviousness analysis based on Toshyuki can implicate the device as presently claimed: one of ordinary skill would not be motivated to shrink the device described to make a microdevice, because doing so would disable it or require inventive skill at the least to make it work. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 2984); MPEP 2143.01. Furthermore, the modified device would still not fall within the range of items understood to be 'microplates' if it

retained multiple wells, even of somewhat smaller volume than the common commercial microplates, because it would still be too large in width and length.

While one of ordinary skill may well be motivated to adjust the size of an item, it cannot be 'obvious' to modify the item in a way that destroys its utility. *In re Gordon.* Thus no combination of Toshiyuki with Siegel or with Zhou can render the claimed invention obvious, either: the proposed combinations would not produce a device within the scope of the claims without destroying the function of the Toshiyuki device.

Furthermore, Siegel is cited in order to add a 'binding partner' to the device of Toshiyuki. To establish a *prima facie* case for an obviousness rejection, the Office must show at least a motivation to combine or modify teachings in the prior art, and a reasonable expectation of success. It is not clear why or how a binding partner from Siegel would be used in combination with Toshiyuki's device, and no precise explanation was provided. Indeed, if such binding partners were present on the surfaces of the reaction plate, they would seem likely to destroy the function of the Toshiyuki device, which according to the Office is intended to measure agglutination of blood. An antibody affixed to the surfaces of the microplate would preclude this function by immobilizing the blood cells and interfering with agglutination. (Siegel used an antibody to affix cells which were then trapped by a second binding means, not to measure agglutination of blood.) While efficiency might be a motivation to modify the device of Toshiyuki, it is not clear how one of ordinary skill would attempt to make the combination that the Office suggests; and it is certainly not obvious that such a combination would provide a 'reasonable expectation of success' in light of the effect the binding partner would be expected to have on the particular use Toshiyuki teaches for the device. Thus the Office has not provided a *prima facie* obviousness case with this combination of references.

The Zhou reference is cited by the Office to provide the specific materials used in certain dependent claims. In light of the foregoing discussion of Toshiyuki and the present claim amendment, the Office cannot rely on Toshiyuki as a basis for a *prima facie* case for an obviousness

rejection in combination with Zhou, either. Thus the Applicant respectfully requests that each of the obviousness rejections based on Toshiyuki be withdrawn.

Finally, the Applicant notes that none of the references were specifically applied to claims 56-57, although those claims were listed among the claims rejected as obvious. The Office has not pointed out a basis for finding these claims obvious; thus these claims appear to be free of the prior art. Likewise, claim 14 appears to be free of any anticipation or obviousness rejections: the Office has not argued or demonstrated that the claimed CoTaZr alloy would have been obvious based on any of the cited references. Claim 14 was rejected along with claims 11-13, which recite a metal or aluminum or magnetic layer: these were rejected over Toshiyuki in combination with Siegel and/or Zhou. However, the Office only pointed to a nickel alloy or aluminum layer in the references; even if those materials rendered claims 11-13 obvious, neither of these materials would render the CoTaZr alloy of the present claims obvious. Thus claims 14 and 56-57 are believed to be novel and nonobvious in light of the absence of specific basis for any obviousness rejections.

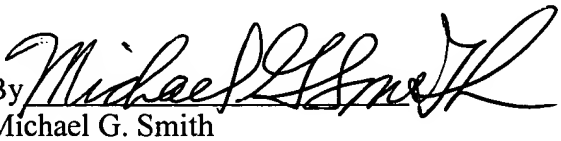
CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw all outstanding rejections and to reconsider the claims in light of the foregoing comments, and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 471842000500. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: July 6, 2005

Respectfully submitted,

By 

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PerkinElmer®
precisely.

Microplate Dimensions

Product name	Description	# rows	# columns	Well Volume	Height (mm)	Length (mm)	Width (mm)	Well Diam. (mm)	Well depth (mm)	A1 to top offset (mm)	A1 to side offset (mm)	Well-to-well spacing (mm)
PicoPlate-24	(white, 24-well, solvent resistant Barex)	4	6	1.80mL	18.7	127.8	85.6	14	9.4	11.59	12.01	20.28
OptiPlate-24	(white, 24-well, untreated)	4	6	2.39mL	18.7	127.8	85.6	14	16.1	11.92	12.41	20.60
CulturPlate-24	(white, 24-well, tissue culture treated, sterile)	4	6	2.39mL	18.7	127.8	85.6	14	16.1	11.92	12.41	20.60
Visiplate-24	(white frame, clear bottom, 24-well)	4	6	3.2mL	20.0	127.7	85.8	14.80	18.7	16.20	19.30	17.90
Visiplate-24 TC	(white frame, clear bottom, 24-well, sterile, lid)	4	6	3.2mL	20.0	127.7	85.8	14.80	18.7	16.20	19.30	17.90
Visiplate-24 TC	(black frame, clear bottom, 24-well, sterile, lid)	4	6	3.2mL	20.0	127.7	85.8	14.80	18.7	16.20	19.30	17.90
PicoPlate-96	(white, 96-well, solvent resistant Barex)	8	12	400µL	14.6	127.8	85.6	7.00	11.3	11.40	14.5	8.99
OptiPlate-96	(white, 96-well, untreated)	8	12	400µL	14.6	127.7	85.5	7.15	10.8	11.24	14.38	9.00
OptiPlate-96 F	(black, 96-well, untreated)	8	12	400µL	14.6	127.7	85.5	7.15	10.8	11.24	14.38	9.00
OptiPlate-96 HB	(white, 96-well, high bind)	8	12	400µL	14.6	127.7	85.5	7.15	10.8	11.24	14.38	9.00
OptiPlate-96 HS	(white, 96-well, grey, high sensitivity)	8	12	400µL	14.6	127.7	85.5	7.15	10.8	11.24	14.38	9.00
CulturPlate-96	(white, 96-well, tissue culture treated, sterile)	8	12	400µL	14.6	127.7	85.5	7.15	10.8	11.24	14.38	9.00
CulturPlate-96 F	(black, 96-well, tissue culture treated, sterile)	8	12	400µL	14.6	127.7	85.5	7.15	10.8	11.24	14.38	9.00
SpectraPlate-96 MB	(clear, 96-well, untreated)	8	12	400µL	14.6	127.7	85.5	7.15	10.8	11.24	14.38	9.00
SpectraPlate-96 HB	(clear, 96-well, high protein binding)	8	12	400µL	14.6	127.7	85.5	7.15	10.8	11.24	14.38	9.00
SpectraPlate-96 TC	(clear, 96-well, tissue culture treated, sterile)	8	12	400µL	14.6	127.7	85.5	7.15	10.8	11.24	14.38	9.00
ProxiPlate-96	(white, shallow 96-well)	8	12	100µL	14.5	127.8	85.5	7.15	3.25	11.24	14.4	9.00
ProxiPlate-96 F	(black, shallow 96-well)	8	12	100µL	14.6	127.8	85.5	7.15	3.25	11.15	14.3	9.00
LumaPlate-96	(white, shallow 96-well, solid scintillator coated)	8	12	100µL	14.6	127.8	85.5	7.15	3.25	11.15	14.3	9.00
Deepwell LumaPlate-96	(white, 96-well, solid scintillator coated)	8	12	400µL	14.6	127.7	85.5	7.15	10.8	11.24	14.38	9.00
Scintiplate-96	(white frame, clear well, 96-well)	8	12	350ul	14.7	127.6	85.6	6.3	11.15	11.30	14.3	9.00
Scintiplate-96 TC	(white frame, clear well, 96-well, TC treated, sterile)	8	12	350ul	14.7	127.6	85.6	6.3	11.15	11.30	14.3	9.00
Scintiplate-96 SA	(white frame, clear well, 96-well, Streptavidin coated)	8	12	350ul	14.7	127.6	85.6	6.3	11.15	11.30	14.3	9.00
Isoplate-96	(white frame, clear well, 96-well)	8	12	350ul	14.7	127.6	85.6	6.3	11.15	11.30	14.3	9.00
Isoplate-96 HB	(white frame, clear well, 96-well, high bind)	8	12	350ul	14.7	127.6	85.6	6.3	11.15	11.30	14.3	9.00
Isoplate-96 TC	(white frame, clear well, 96-well, TC treated, sterile)	8	12	350ul	14.7	127.6	85.6	6.3	11.15	11.30	14.3	9.00
Black Isoplate-96	(black frame, clear well, 96-well)	8	12	350ul	14.7	127.6	85.6	6.3	11.15	11.30	14.3	9.00
Black Isoplate-96 HB	(black frame, clear well, 96-well, high bind)	8	12	350ul	14.7	127.6	85.6	6.3	11.15	11.30	14.3	9.00
Black Isoplate-96 TC	(black frame, clear well, 96-well, TC treated, sterile)	8	12	350ul	14.7	127.6	85.6	6.3	11.15	11.30	14.3	9.00
ViewPlate-96 black	(black, 96-well, clear bottom, TC, sterile)	8	12	360µL	14.6	127.8	85.6	6.50	11.4	11.30	14.3	9.00
ViewPlate-96 white	(white, 96-well, clear bottom, TC, sterile)	8	12	360µL	14.6	127.8	85.6	6.50	11.4	11.30	14.3	9.00
UniFilter-96	(white, shallow, 96-well, barex filter plate)	8	12	150µL	14.6	127.8	85.6	6.96	3.2	11.35	14.45	8.99
Harvestplate	(white, deep-well, 96-well, barex filter plate)	8	12	350µL	14.6	127.4	85.2	6.96	10.6	11.15	14.33	8.99
OptiPlate-384	(white, 384-well, untreated)	16	24	105µL	14.35	127.8	85.5	3.65	10.4	9.00	12.1	4.50
OptiPlate-384 F	(black, 384-well, untreated)	16	24	105µL	14.35	127.8	85.5	3.65	10.4	9.00	12.1	4.50
OptiPlate-384 HS	(white, 384-well, grey, high sensitivity)	16	24	105µL	14.35	127.8	85.5	3.65	10.4	9.00	12.1	4.50
CulturPlate-384	(white, 384-well, tissue culture treated, sterile)	16	24	105µL	14.35	127.8	85.5	3.65	10.4	9.00	12.1	4.50
CulturPlate-384 F	(black, 384-well, tissue culture treated, sterile)	16	24	105µL	14.35	127.8	85.5	3.65	10.4	9.00	12.1	4.50
SpectraPlate-384 MB	(clear, 384-well, untreated)	16	24	105µL	14.35	127.8	85.5	3.65	10.4	9.00	12.1	4.50
SpectraPlate-384 HB	(clear, 384-well, high protein binding)	16	24	105µL	14.35	127.8	85.5	3.65	10.4	9.00	12.1	4.50
SpectraPlate-384 TC	(clear, 384-well, tissue culture treated, sterile)	16	24	105µL	14.35	127.8	85.5	3.65	10.4	9.00	12.1	4.50
ProxiPlate-384	(white, shallow 384-well)	16	24	30µL	14.4	127.8	85.6	3.30	5.5	9.05	12.15	4.50
ProxiPlate-384 F	(black, shallow 384-well)	16	24	30µL	14.4	127.8	85.6	3.30	5.5	9.05	12.15	4.50
ProxiPlate-384 NEW	(white, shallow 384-well)	16	24	28µL	14.4	127.8	85.5	3.30	5.3	8.99	12.13	4.50
ProxiPlate-384 F NEW	(black, shallow 384-well)	16	24	28µL	14.4	127.8	85.5	3.30	5.3	8.99	12.13	4.50
ProxiPlate-384 HS	(grey, shallow 384-well)	16	24	28µL	14.4	127.8	85.5	3.30	5.3	8.99	12.13	4.50
ViewPlate-384 black	(black, 384-well, clear bottom, TC, sterile)	16	24	105µL	14.6	127.8	85.6	3.38	12.7	9.07	12.15	4.50
ViewPlate-384 white	(white, 384-well, clear bottom, TC, sterile)	16	24	105µL	14.6	127.8	85.6	3.38	12.7	9.07	12.15	4.50
AcycloPlate-384	(black, 384-well, PCR plate)	16	24	40µL	9.50	127.8	85.5	3.00	9.0	9.00	12.13	4.50
PolyPlate-384	(white polypropylene, 384-well)	16	24	105µL	14.4	128.0	86.0	3.70	11.70	9.00	12.10	4.40
OptiPlate-1536	(white, 1536-well, untreated)	32	48	12µL	10.4	127.8	85.5	1.70	5.0	7.88	11.03	2.25
OptiPlate-1536 F	(black, 1536-well, untreated)	32	48	12µL	10.4	127.8	85.5	1.70	5.0	7.88	11.03	2.25